Twin Creeks Mine – South Project
Responses to Comments Received During the Public Notice Period

Comments from Tom Meyers and Christie Whiteside (Great Basin Mine Watch) were e-mailed to NDEP on Wednesday, November 27th during the public notice period and are summarized below with the respective NDEP responses:

GBMW Comment: The PiZon Tailings Impoundment has been leaking since 1995 when cyanide was discovered in monitoring well MW-2. The Fact Sheet prepared for this renewal did not mention the leaky tailings facility. This would appear to violate NAC 445A.401 specifying what the fact sheet should contain. Monitoring well MW-2 was determined to be acting as a conduit for contaminants was replaced by monitoring well MW-2R-1 (completed in alluvial zone). Monitoring well MW-2R-1 and monitoring well 29-6 (also screened in the alluvial aquifer) have shown elevated (or increasing) chloride levels and detectable WAD cyanide. The PiZon Tailings Impoundment is clearly degrading waters of the state. Although detected WAD cyanide levels are below the MCL standard, the presence of this constituent in any level in a monitoring well is indicative of contamination, as are rising levels of chloride.

It appears as if the Division has allowed Newmont to continue polluting the aquifer without any restrictions, or schedules of compliance. We could find no difference between the old permit and this renewal, except for removal of item 5 in Section G which states that failure to contain process fluids resulting in a spill or release to waters of the State would be considered a violation of permit limitations. The release of process fluids from the PiZon Tailings Impoundment into waters of the state qualifies as a permit violation for the old permit. Why has this limitation been removed from the permit renewal? We respectfully request that the Division rethink its' practice of relaxing permit requirements and enforcement in response to a company's failure to meet limitations.

NDEP Response: The NDEP noted operational concerns relative to the original design document prepared by Russ Browne, P.E. at the Pinon Tailings impoundment during NDEP's inspection of June 11, 1991 when the facility was owned and operated by Santa Fe Pacific Gold Corporation. During that inspection, the supernatant pool depth was documented at 12 feet and a "wet spot" on the exterior face of the dam was observed. Santa Fe Pacific Gold Corporation (SFPG) was directed to lower the depth of the supernatant pool since "control of the impoundment pool will largely affect seepage within the embankment". The amount of seepage within the embankment is directly related to the design carrying capacity of the perforated recovery pipes located above the nominal 12-inch soil liner but under the dam footprint. Concern was that with increased seepage through the embankment, the capacity of the recovery pipes could be exceeded,

thus potentially causing process water to flow elsewhere. As a result of the NDEP directive, by February 11, 1992, the supernatant pool depth at the decant structure was reported as 5.5 feet; and according to subsequent inspections and required reporting, the pool has not exceeded the design depth since that time.

As indicated, low concentrations of cyanide were then detected in MW-2 in October 1995. This detection of cyanide prompted SFPG to assemble a team of scientists and engineers to evaluate and characterize seepage fluids which had migrated into the vadose zone. As referenced in the received comments, MW-2 was abandoned (plugged 10/98) since it was believed to be acting as a conduit; and it was replaced with monitoring well MW-2R-1. The cyanide and chloride concentrations in monitoring wells MW-2R-1 and 29-6 are within the maximum contaminant levels (mcl's) for those constituents, and these wells continue to be monitored. It should be noted that according to the Phase III internal data review of June 1998, elevated chlorides have historically existed. In October 1996, the first Summary Report of a phased approach on vadose zone characterization was received which provided pertinent information and data on the vadose zone and regional aquifer. Conclusions and recommendations were provided in each report following implementation, with the most recent conclusions and recommendations found in the Summary Report February 2000.

The Fact Sheet has been revised to reference the tailings impoundment status. With respect to the Water Pollution Control Permit, the NDEP does not believe that restrictions or schedules of compliance are necessary beyond what is included in the permit and the steps that have been taken to date to address the site concerns. Part I.G.5 of the old permit was removed because it is redundant. The Division does not concur that it has relaxed permit requirements or enforcement, but rather contends that appropriate measures have been and are being taken to date to address concerns.

GBMW Comment: The draft permit, instead of attempting to rectify the situation, perpetuates the already insufficient monitoring regime. Although the Division required Newmont to install monitoring well MW-29-5 near the southwest corner of the facility, this well is not part of the monitoring regime for permit number NEV89035. Although sampling of the vadose zone has shown that seepage is occurring on the eastern and western edges of the tailings impoundment there is no monitoring of alluvial wells required for this part of the impoundment.

Vadose wells VW-15 and VW-14, adjacent to the eastern border of the tailings impoundment, show the highest levels of cyanide contamination (Figure 4. 4th Quarter 1998), yet this is in an area in which no monitoring of the alluvial aquifer is conducted. Additionally, the plan of action (Phase 3) of the work plan submitted to NDEP by Santa Fe Pacific in 1996 called for quarterly monitoring of the vadose zone wells, and expanded water quality testing in monitoring wells to include total cyanide, ammonia, total phosphorus, aluminum, antimony, cobalt, molybdenum, nickel and vanadium. The draft permit does not but should include vadose well monitoring or sampling for cyanide, cobalt, ammonia, total phosphorus, molybdenum, or vanadium. Cobalt cyanide

complexes are persistent, and although no standards exist for it, it should be considered in cases in which cyanide is a potential contaminant.

NDEP Response: The draft permit and monitoring regime are based in part on plans, data, information and recommendations submitted to and reviewed by NDEP. As referenced above, a phased plan approach was initiated by Santa Fe Pacific Gold in 1996. This phased approach has resulted in "Summary Reports" that include results, data conclusions and recommendations. This information and recommendations are adopted by reference as part of the Water Pollution Control Permit and have been incorporated in the permit where appropriate. Four monitoring wells adjacent to the tailings impoundment, three in the Pinon Mill/Osgood leach pad area and 23 vadose zone monitoring wells have been incorporated into the permit with quarterly sampling frequencies. Profile II constituents are monitored.

GBMW Comment: Additionally, according to this work plan, if cyanide is detected in any of the alluvial monitoring wells at concentrations below 0.1 mg/L, fate of transport modeling would be conducted and the results would be used to estimate the extent of plume mitigation within the regional aquifer. The most recent monitoring reports submitted by Newmont to the NDEP in support of this permit indicate that WAD cyanide is present in monitoring wells in concentrations less than 0.1 mg/L, but there is no indication that the work plan is being implemented. The Division should have, at the very least, required Newmont to drill additional wells in this area to determine if contamination is occurring in this portion this portion of the regional aquifer, and if so, to help determine the size and extent of the plume.

NDEP Response: Only if the WAD cyanide results of the chemical analysis were greater than 0.1 mg/L would the work plan be initiated to Action Level 2. "If the results of the chemical analysis indicate the WAD cyanide concentration is less than 0.1 mg/L, SFPG (i.e. Newmont) will perform fate of transport modeling. In September 2000, the document titled "Prediction of Fate and Extent of Cyanide Emanating from Pinon Tailings Impoundment at Twin Creeks Mine" was submitted to NDEP by Hydrologic Consultants, Inc. The results are as follows:

1. Despite incorporating conservative assumptions into the numerical simulations, the model predicts that WAD cyanide will not migrate a significant distance in the lateral direction, and that the area of WAD cyanide concentrations greater than 200 parts per billion is within the immediate vicinity of the tailings impoundment after 30 years.

2. Cyanide concentrations will dilute and attenuate to below Federal Drinking Water Standards through mixing with large volumes of groundwater and through natural attenuation.

3. The results of simulating three different scenarios of managing the Pinon Tailings Impoundment indicate that there would be no significant difference in the migration of cyanide under the scenarios over the next 90 years.

Continued groundwater monitoring is recommended, which has been incorporated into the permit, and further modeling should not be necessary unless future monitoring results suggest that the plume is migrating farther or faster than predicted in the study.

GBMW Comment: Santa Fe Pacific commissioned a study by HCI in 1996 to determine the extent of tailings seepage in the vadose zone. The results of the study indicated that there is seepage moving through the vadose zone, and a perched system, which was encountered approximately 66 to 75.5 feet below the ground surface, and separated from the regional aquifer by 5 to 25 feet. Contamination was encountered in the perched zone. The report by HCI indicated that there was minimal communication between the perched zone and the regional aquifer, and that the contamination in the regional aquifer was a result of MW-2. Since that time, MW-2R-1, and MW-29-6, screened in the alluvial zone have tested for elevated levels of WAD cyanide, and rising chloride levels. As will be discussed, there are substantial reasons to doubt the analysis and the conclusion that the MW-2 is the primary cause of contamination in the regional aquifer.

There are several problems with the HCI 2000 analysis that indicate MW-2 may not be the sole source of contamination for the regional aquifer. As mentioned, there is cyanide present in most of the VW wells and the concentration was increasing in 1999 at some of those wells. The pump tests described on page 7 state that because "[n]o change in water level was recorded in VW-7", which is just 10 feet away, there is no hydraulic connection. It is not possible to assess the test because the document does not even describe the pumping rate. Presumably, the pump was at the bottom of MW-2. If it was pumped at low flow rates, it would have primarily pumped water from below the aquitard even though MW-2 is screened through both zones. Six hours of pumping may not have established enough of a gradient across the aquitard to make any difference. Thus, without more detail, the pump test proves nothing.

NDEP Response: Monitoring wells MW29-6, MW-2R-1 and the VW wells are in the WPCP. They will continue to be monitored as recommended by HCI. The NDEP notes comments regarding HCI results and analysis and suggests communication with HCI.

GBMW Comment: It is apparent in this case that the state is relying on the conjecture that the perched zone is separate from the regional zone and that there has not truly been contamination of the waters of the state. Does the state argue that this perched aquifer was created by the leak? If so, it is still a water of the state. However, because its' water quality upon formation is poor, and thus the state would appear to be unconcerned about remediating this perched, albeit artificial aquifer. Is this a correct interpretation of the State's position on this?

The analysis provided by HCI does not prove there is no connection. In addition to pump tests, it is essential to determine the moisture status of the aquitard. If the aquitard is unsaturated, then there is a clear disconnect and it is only a matter of time until the contaminants present across the "perched" aquifer actually reach the regional aquifer. The only way to determine the saturated status of the aquitard would be to screen a well solely in the aquitard. Thus, we recommend that NDEP require Newmont to develop such a well. Preferably, there would be a well with multiple screenings: in the saturated vadose zone, in the aquitard, and in the regional aquifer.

Additional evidence for a disconnect would be to find that wells screened solely beneath the aquitard have some artesian pressure. It is extremely unlikely that an unconfined aquifer would have a head that equals the level of the bottom of an aquitard just above it. Thus, we recommend that NDEP compare the head in the regional aquifer monitoring wells to the elevation of the bottom of the aquifer.

NDEP Response: The NDEP believes that appropriate actions have been taken to address the site concerns. Comments are noted. We have no reason to believe that information presented to the State is not accurate. Thus, recommendations provided to the State, such as continued monitoring, shall be carried out.

GBMW Comment: In general, while it appears that there has been some effort to define the seepage plume, and determine the fate of cyanide in the vadose zone, and potentially the regional aquifer, we find the draft permit to be inadequate in terms of tangible solutions to the ongoing degradation of groundwater occurring at the Twin Creeks South Mine. Additionally, although the work plan developed in response to the contamination appears to have some good steps to be followed, it is ultimately rendered useless unless the Division actually enforces its provisions. As an example, although the draft permit contains a permit limitation under Section G. Item 3. for the depth and size of the tailings impoundment pool, there are no tangible limits set for what will be considered acceptable, except for a reference to "acceptable design criteria". Since the tailings facility has been shown to leak, and investigation suggests that the size and depth of the pool has a direct influence on how much seepage occurs, it is possible that the original design criteria of the tailings facility should be reconsidered, and tangible limits should be required and adhered to to ensure minimization of the seepage.

NDEP Response: The NDEP believes the efforts to define the seepage plume and determine the fate of cyanide in the vadose zone and potentially the regional aquifer coupled with NDEP's instruction to SFPG on June 11, 1991 to adhere to design/operational parameters (i.e. design criteria) used by Russ Browne, P.E. are tangible and reasonable. We concur that the work plan developed in response to the contamination appears to have some good steps to be followed. Based on our review, all necessary provisions of the work plan have been completed to date.

GBMW Comment: Again, as we have stated in similar situations, it is not sufficient to simply monitor and model degradation while it continues to occur. The workplan has

indicated the installation of pump wells, which is a step in the right direction, as it is possible that perpetual pumpage of contaminated water may be required in the future; however, we urge the Division to take a proactive approach in protecting waters of the state, and to require this tailings impoundment to be closed to prevent the continued expansion of the contaminant plume unless it can be proven that contamination is not occurring. The burden of proof should be on Newmont, not the public.

NDEP Response: As recommended by HCI consultants, "pumping is not a viable remedial method" but continued monitoring is necessary. However, pumping of wells 29-6 and 2R-1 has occurred since 1999. The NDEP believes that the cause/source was identified very early by NDEP and mitigation required of Santa Fe Pacific Gold Corporation with continuation by Newmont Mining Corporation, is appropriate.